

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

SITE INFORMATION:

Unocal 5905
18015 Bothell Way NE
Bothell, King County, WA 98011

Cleanup Site ID: 8853
Facility/Site ID: 35644949

| | | | |
|-----------|-----|----------------|------------|
| Section: | 7 | Latitude: | 47.75872 |
| Township: | 26N | Longitude: | -122.21116 |
| Range: | 5E | Tax/Parcel ID: | 0726059114 |

Site Scored/ranked for the August 2013 Hazardous Sites List Publication

SITE DESCRIPTION:

The Unocal 5905 site is a former gas station located in Bothell, King County, Washington. The 0.78-acre property is located approximately 625 feet from Sammamish River, and zoned for commercial (GC) use.

Adjacent properties include an automobile dealership across NE 180th Street to the south, a fenced parking lot to the west, Bothell Way NE to the east (beyond which is vacant City of Bothell land), and to the north is Ormbeck Street and a veterinary clinic.

The site is currently operated as a Chevron Extra Mile & Car Wash by Allen L Haynes.

The site is currently developed and used as a Chevron gas station and car wash with a convenience store. A car wash was previously located in the northern portion of the property, however it was not operated by Unocal.

The site is located at the northwest corner of NE 180th Street and Bothell Way NE, in Bothell, Washington.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

| <u>From</u> | <u>To</u> | <u>Operator/Tenant</u> | <u>Activity</u> |
|-------------|-----------|------------------------|-------------------------------|
| 1993 | 2013 | Chevron Extra Mile | gasoline station and car wash |
| | 1992 | Unocal | gasoline station |

SITE CONTAMINATION:

In 1990 the Unocal 5905 site was reported to Washington Department of Ecology and placed on the LUST list with ID number 455.

In 1992 a subsurface vapor extraction system was being installed in the northern portion of the site (associated with another release and known in-situ soil contamination near the eastern property line). During excavation activities, petroleum contaminated soil was encountered near two sumps associated with a former car wash operation at the northern portion of the site, operated prior to 1984.

Seven test pits were excavated to assess the extent of soil contamination identified during the VES installation process, and two car wash sumps were removed from the northern portion of the site. Soil samples collected from test pit TP-1 contained concentrations of diesel and/or oil range hydrocarbons exceeding the MTCA Method A cleanup levels.

In December 1992, approximately 225 cubic yards of petroleum contaminated soil near test pits TP-1 and TP-3 was excavated to a depth of 9 feet below ground surface. Confirmation soil samples were collected from the excavation for analysis, and results indicated concentrations of diesel and oil range hydrocarbons, as well as VOCs, were below cleanup levels.

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PAST REMEDIATION ACTIVITIES:

Heavy-oil range hydrocarbons were detected in groundwater at well MW-9 in June 1992, at a concentration exceeding the MTCA Method A cleanup level. Additional groundwater sampling and monitoring activities were conducted by GeoEngineers to investigate groundwater conditions downgradient of the former Unocal UST pit between 1992 and 1994. A new gasoline station was constructed at the site in 1993. Benzene was detected at concentrations above the MTCA Method A cleanup level in groundwater samples from wells MW-5, MW-9 and MW-10 in December 1994.

CURRENT SITE CONDITIONS:

Groundwater sampling data from December 1994 (the most recent results in the Ecology site file) indicate concentrations of benzene at wells MW-9, MW-10, and MW-5 exceed MTCA Method A cleanup levels at concentrations of 24 ppb, 43 ppb, and 6.5 ppb, respectively.

Benzene contamination in groundwater has been identified in three monitoring wells downgradient of the former gasoline UST pit.

The approximate depth to groundwater is 8-9 feet below ground surface, with groundwater flowing to the east. Subsurface soils are sand and silt.

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for WARM scoring

Surface Water

Release occurred in the subsurface.

Air

Benzene release to soil and groundwater at the site.

Groundwater

Benzene release to soil and groundwater at the site.

Prior remedial activities have reduced concentrations of gasoline and diesel in groundwater at the site to below MTCA Method A cleanup levels, however residual benzene concentrations at three monitoring wells exceeded cleanup levels in 1994.

ROUTE SCORES:

Surface Water/ Human Health:

Surface Water/ Environment:

Air/ Human Health: 28.6

Air/ Environment: 1.5

Groundwater/ Human Health: 35.2

Overall Rank: 4

REFERENCES:

WARM Toxicological Database

WARM Scoring Manual

Washington Department of Transportation 24-hour Isopluvial Maps, January 2006 update.
<http://www.wsdot.wa.gov/publications/fulltext/Hydraulics/Wa24hrIsopluvials.pdf>

King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed January 2013.
<http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx>

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Summary Score Sheet

National Climatic Data Center 2011 Local Climatological Data for Seattle, Seattle Tacoma Airport.
<http://www1.ncdc.noaa.gov/pub/orders/IPS-90B1F39F-6CFA-4A6B-AA82-5ED1FF897CCC.pdf>

Washington State Department of Health Source Water Assessment Maps. March 2011 update.
<https://fortress.wa.gov/doh/eh/dw/swap/maps/>

Ecology Water Resources Explorer, accessed January 2013.
<https://fortress.wa.gov/ecy/waterresources/map/WaterResourcesExplorer.aspx>

FEMA Map Service Center, accessed January 2013.
<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>

Missouri Census Data Center, Circular Area Profiles - 2010 census data around a point location.
<Http://mcdc.missouri.edu/websas/caps10c.html>. Accessed February 2013

GeoEngineers, 1993, Report of Geoenvironmental Services Supplemental Subsurface Investigation and Remedial Excavation Monitoring Activities Unocal Service Station 5905. March 30.

GeoEngineers, 1993, Progress Report No. 2 Quarterly Ground Water Monitoring Former Unocal Service Station 5905 Bothell, Washington. June 18.

GeoEngineers, 1996, Results of Ground Water Sampling December 1994 Former Unocal Service Station 5905 Bothell, Washington. January 19.

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 8853

Unocal 5905

Facility/Site ID: 35644949

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Not applicable

Explain the basis for choice of substances to be used in scoring:

List those management units to be considered for scoring:

Explain basis for choice of unit to be used in scoring:

2. AIR ROUTE

List those substances to be considered for scoring:

Benzene

Explain the basis for choice of substances to be used in scoring:

MTCA Method A exceedance in three groundwater monitoring wells.

List those management units to be considered for scoring:

Soil Vapor

Explain basis for choice of unit to be used in scoring:

Potential for vapor transport

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Benzene

Explain the basis for choice of substances to be used in scoring:

MTCA Method A exceedance in three groundwater monitoring wells.

List those management units to be considered for scoring:

Groundwater

Explain basis for choice of unit to be used in scoring:

MTCA Method A exceedance in three groundwater monitoring wells.

Worksheet 5

Air Route

CSID: 8853

Site Name: Unocal 5905

1.0 Substance Characteristics

1.1 Introduction (WARM Scoring Manual) - Please Review before scoring

1.2 Human Toxicity

| Substance | Ambient Air Standard Value | Acute Toxicity Value | Chronic Toxicity Value | Carcinogenicity Value |
|-----------|----------------------------|----------------------|------------------------|-----------------------|
| Benzene | 10 | 3 | X | 5 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Highest Value 10
 Bonus Points? 0
 Toxicity Value

1.3 Mobility

| | |
|----------------------|--|
| Gaseous Mobility | Max Value: 4 |
| Particulate Mobility | Soil Type: Erodibility: Climatic Factor: |

Mobility Value

1.4 Final Human Health Toxicity/Mobility Matrix Value

HH Final Matrix Value

1.5 Environmental Toxicity/Mobility

| Substance | Non-human Mammalian Inhalation Toxicity (mg/m3) | Acute Value | Mobility Value | Table A-7 Matrix Value |
|-----------|---|-------------|----------------|------------------------|
| Benzene | 31947 | 3 | 4 | 6 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Env. Final Matrix Value

1.6 Substance Quantity

Amount: 950 square feet

Basis: Estimated surface area of contaminated soil/groundwater

Substance Quantity Value

Worksheet 5

Air Route

CSID: 8853

Site Name: Unocal 5905

2.0 Migration Potential

2.1 Containment

Containment Value

Explain Basis: Assume 2' thick cover, no vapor collection system

3.0 Targets

3.1 Nearest Population

Population Distance Value

Residences within 500 feet

3.2 Distance to and name of nearest sensitive environments

Sensitive Environment Value

Approximately 625' to Sammamish River

3.3 Population within 0.5 miles

Population Value

2444 population

4.0 Release

Release to Air Value

Explain basis for scoring a release to air
no confirmed release

Pathway Scoring - Air Route, Human Health Pathway

$$AIR_H = (SUB_{AH} * 60/329) * [REL_A + (TAR_{AH} * 35/85)] / 24$$

Where:

$$SUB_{AH} = (\text{Human toxicity} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

REL_A = Release to Air

$$TAR_{AH} = \text{Nearest Population} + \text{Population within 1/2 mile}$$

| | |
|------------------------|-------------|
| SUB _{AH} | 154 |
| REL _A | 0 |
| TAR _{AH} | 59 |
| AIR_H | 28.6 |

Pathway Scoring - Air Route, Environmental Pathway

$$AIR_E = (SUB_{AE} * 60/329) * [REL_A + (TAR_{AE} * 35/85)] / 24$$

Where:

$$SUB_{AE} = (\text{Environmental Toxicity Value} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

REL_A = Release to Air

$$TAR_{AE} = \text{Nearest Sensitive Environment}$$

| | |
|------------------------|------------|
| SUB _{AE} | 70 |
| REL _A | 0 |
| TAR _{AE} | 7 |
| AIR_E | 1.5 |

Worksheet 6
Groundwater Route

CSID: 8853

Site Name: Unocal 5905

1.0 Substance Characteristics

1.1 Human Toxicity

| Substance | Drinking Water Standard Value | Acute Toxicity Value | Chronic Toxicity Value | Carcinogenicity Value |
|-----------|-------------------------------|----------------------|------------------------|-----------------------|
| Benzene | 8 | 3 | X | 5 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Highest Value 8
 Bonus Points? 0
 Toxicity Value

1.2 Mobility

Cations/Anions Max Value:
 Solubility Max Value: 3
 Mobility Value

1.3 Substance Quantity

Amount: 20-60 cubic yards of soil
 Basis: Estimated volume of impacted soil remaining in-place
 Substance Quantity Value

2.0 Migration Potential

2.1 Containment Containment Value
 Explain Basis: Contaminated soil

2.2 Net Precipitation 10-20 inches Net Precipitation Value

2.3 Subsurface Hydraulic Conductivity Conductivity Value
 silt/sand

2.4 Vertical Depth to Groundwater Depth to Aquifer Value
 confirmed release to groundwater (8-9 ft bgs)

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value
 Irrigation, stock water, domestic drinking water

3.2 Distance to Nearest Drinking Water Well Well Distance Value
 Within 1/4 mile

3.3 Population Served within 2 Miles Population Served Value
 132 population (estimated)

Worksheet 6
Groundwater Route

CSID: 8853

Site Name: Unocal 5905

3.4 Area Irrigated by GW Wells within 2 miles

Area Irrigated Value

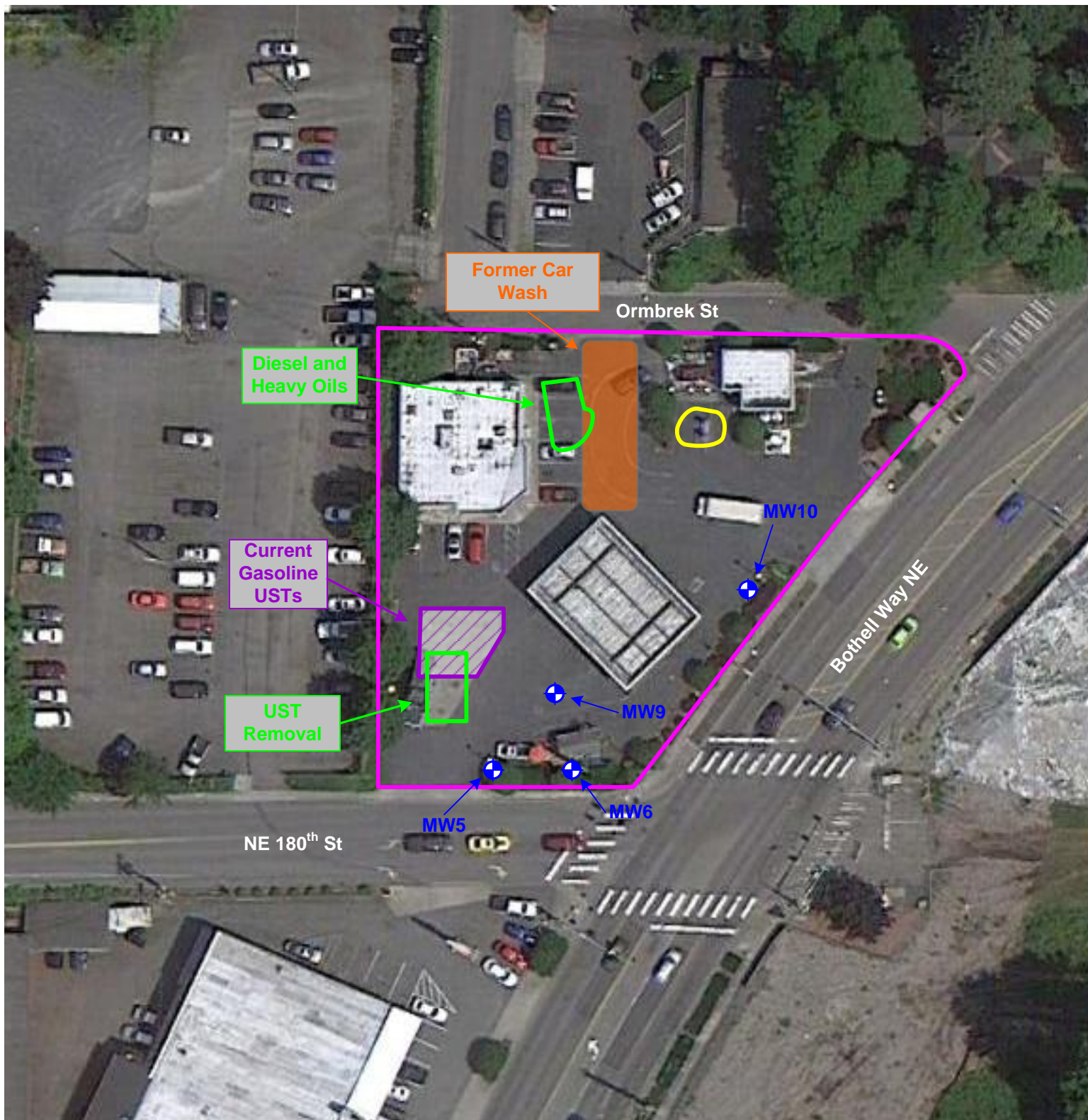
approximately 13 acres

4.0 Release

Release to Groundwater Value

Explain basis for scoring a release to groundwater:
confirmed release

| Pathway Scoring - Groundwater Route, Human Health Pathway | |
|--|-------------------------------|
| $GW_H = (SUB_{GH} * 40 / 208) * [(MIG_G * 25 / 17) + REL_G + (TAR_{GH} * 30 / 165)] / 24$ | |
| Where: | |
| $SUB_{GH} = (\text{Human toxicity} + \text{mobility} + 3) * (\text{Containment} + 1) + \text{Substance Qty}$ | SUB _{GH} 156 |
| $MIG_G = \text{Depth to Aquifer} + \text{Net Precip} + \text{Hydraulic Conductivity}$ | MIG _G 13 |
| $REL_G = \text{Release to Groundwater}$ | REL _G 5 |
| $TAR_{GH} = \text{Aquifer Use} + \text{Well Distance} + \text{Population Served} + \text{Area Irrigated}$ | TAR _{GH} 22.19328875 |
| | GW_H 35.2 |




Legend:

- Property Location (approximate)
- Excavation Location (approximate)
- Sump Excavation (approximate)
- ⊕ Gasoline/BTEX Impacts (approximate)

Notes:

1. All locations are approximate, and not to scale.





DEPARTMENT OF
ECOLOGY
State of Washington

Unocal 5905
18015 Bothell Way NE
Bothell, WA 98011

Site Overview Map

CSID 8853
CSID8853.vsd

Washington Ranking Method Route Scores Summary and Ranking Calculation Sheet

Site Name: Unocal 5905

CSID: 8853

Site Address: 18015 Bothell Way NE

FSID: 35644949

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

| Pathway | Route Score | Quintile Group |
|---------------|-------------|----------------|
| Surface Water | ns | 0 |
| Air | 28.6 | 4 |
| Groundwater | 35.2 | 3 |

| | |
|----|---|
| H= | 4 |
| M= | 3 |
| L= | 0 |

$$\frac{H^2 + 2M + L}{8} = \frac{16 + 6 + 0}{8} = 3$$

**Human Health
Priority Bin Score:**
3
rounded up to
next whole
number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

| Pathway | Route Score | Quintile Group |
|---------------|-------------|----------------|
| Surface Water | ns | 0 |
| Air | 1.5 | 1 |

| | |
|----|---|
| H= | 1 |
| L= | 0 |

$$\frac{H^2 + 2L}{7} = \frac{1 + 0}{7} = 1$$

**Environment
Priority Bin Score:**
1
rounded up to
next whole
number

Comments/Notes:

**FINAL
MATRIX
RANKING** 4

FOR REFERENCE:

Final WARM Bin Ranking Matrix

| Human Health Priority | Environment Priority | | | | | |
|-----------------------|----------------------|---|---|---|---|-----|
| | 5 | 4 | 3 | 2 | 1 | N/A |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 2 | 2 | 2 | 3 | 2 |
| 3 | 1 | 2 | 3 | 4 | 4 | 3 |
| 2 | 2 | 3 | 4 | 4 | 5 | 3 |
| 1 | 2 | 3 | 4 | 5 | 5 | 5 |
| N/A | 3 | 4 | 5 | 5 | 5 | NFA |

Quintile Values for Route Scores - February 2013 Values

| Quintile | Human Health | | | Environment | |
|----------|---------------|---------|--------------|---------------|---------|
| | Surface Water | Air | Ground Water | Surface Water | Air |
| 5 | >= 27.0 | >= 32.0 | >= 50.1 | >= 47.0 | >= 32.0 |
| 4 | >= 18.5 | >= 21.1 | >= 40.4 | >= 30.3 | >= 26.1 |
| 3 | >= 12.4 | >= 13.1 | >= 31.6 | >= 21.4 | >= 21.1 |
| 2 | >= 7.5 | >= 7.1 | >= 22.4 | >= 11.0 | >= 14.6 |
| 1 | < 7.5 | < 7.1 | < 22.4 | < 11.0 | < 14.6 |

Quintile value associated with each route score entered above